

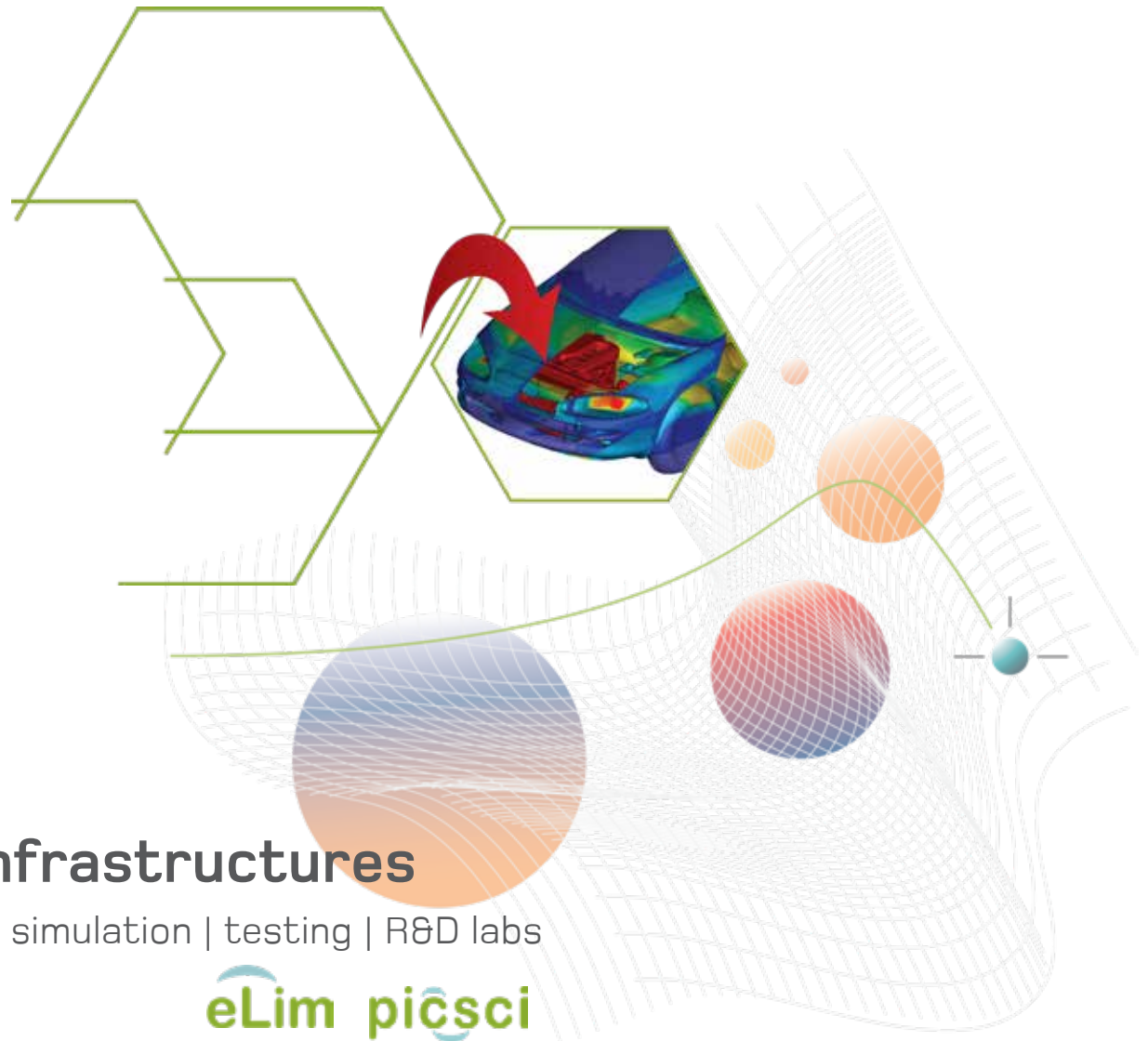
Applus⁺
Software

matereality

digitalization infrastructures

materials & processes | simulation | testing | R&D labs

eLim picsci



introduction

Digital transformation is being applied to all aspects of enterprises today. A robust digital infrastructure provides workspaces for daily tasks, while consuming and organizing data in the background. Enormous benefits in operational efficiency, productivity and accuracy can be achieved by going fully digital, with a unified infrastructure to handle all data without gaps. Data is repurposed for other users as needed, remaining traceable and interlinked, for better integration and collaboration.

Such a system, deployed enterprise-wide, can be used to operate and improve manufacturing, testing, design and simulation, and product development.

Technical information is complex and diverse, and is hence one of the last frontiers of digitalization. Applus+ Matereality's patented software has been created for these challenging tasks, with proven field-tested reliability.



digitalization software

Our digitalization technology provides role-specific software adoption tools to automate and aid daily tasks of materials engineers, R&D/simulation engineers, test labs, and designers. Every aspect of the highly technical information resulting from these tasks is captured in digital libraries to be seamlessly accessible by others at various stages of the product life cycle. When deployed across the enterprise, digitalization software brings harmony, efficiency, and control while minimizing risk.

A common infrastructure allows for highly integrated operations on a robust field-tested environment, within the enterprise, or on the cloud.



connections

Digitalization requires a strong understanding of both the virtual and real systems. Our software leverages more than 20 years of DatapointLabs' experience in the operation of testing laboratories, and in understanding the physics of materials, as used in simulation and in product development. Our knowledge lets us bridge the world of test labs to engineering teams to enterprise databases.

materials & processes



build and manage curated material data collections for use across your ecosystem and product life cycle, including advanced tasks: simulation material modeling, specifications management, and master material file management



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test laboratories



lab information management infrastructure for the operation of test laboratories, fully integrated data gathering, analytics, and collaboration tools



pg 8

R&D laboratories



electronic lab notebooks for scientific experimentation beyond materials, allowing scientists and engineers to develop and implement testing programs, collect, analyze, and report



pg 9

Tools for data visualization, comparison, analytics, report writing, presentations, and collaborations

software & infrastructure for materials

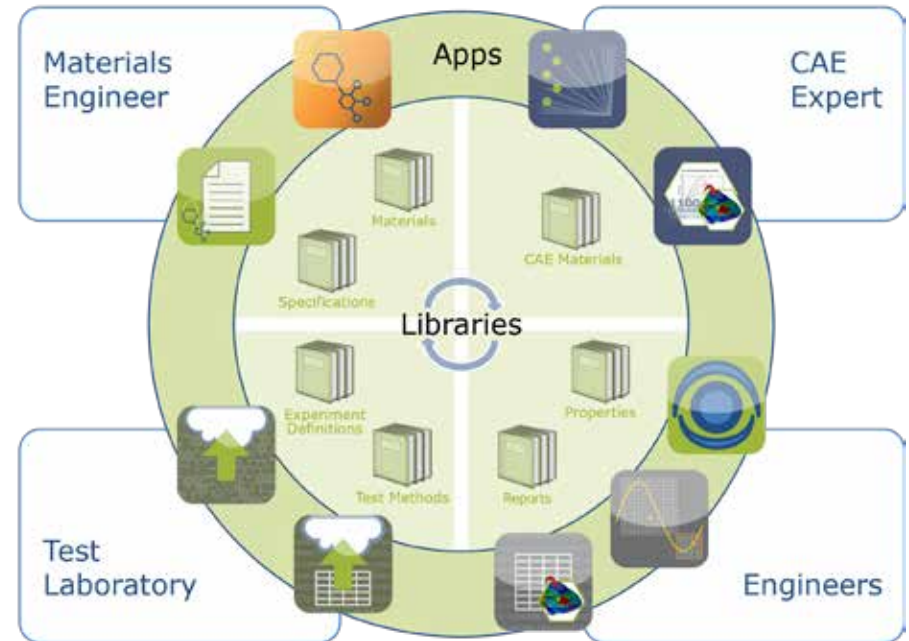
Matereality provides software to build an enterprise-wide materials knowledge core, and facilitates every interaction with material data. Every aspect of this complex and highly varied data can now be carefully organized in libraries and supported by analytical tools and software modules to aid materials engineers, CAE engineers, test labs, and designers in their daily tasks. When deployed across the enterprise, the Matereality software brings harmony, efficiency, and control while minimizing risk.


why you need a materials infrastructure

Manufacturing enterprises have moved to the use of modern materials, novel manufacturing processes, and simulation-based product development. Designing in this environment makes it vital that engineers use real material data before their products become real. The material data can come from a variety of trusted sources. It must be uniform, controlled and traceable, readily accessible, and consumable by simulation solvers and other external processes that need materials information.

withstanding the test of time

The extreme heterogeneity of material data challenges conventional database structures. Our robust, patented cloud infrastructure has been in continuous operation for more than a decade, adding new materials, manufacturing processes, and support for simulation solvers without database modification.





Workgroup Material DatabasePro
Collaborate Securely

solutions for companies of all sizes

The Material Data Server is a total enterprise solution deployed on internal corporate servers.

Workgroup Material DatabasePro is a lighter, cloud-based option, available at fractional cost to engineering teams for the short to medium term.

need data?
DatapointLabs' ISO 17025 certified laboratory can help populate your database by testing your materials and delivering high-quality, product-specific data, or by assisting with transfer of your legacy data.



material data server infrastructure

The enterprise data server forms a centralized, extensible library core, connected to a suite of software to help employees understand and use their material data in a consistent way. Collaboration, authorship, and management layers allow for highly specific access and management of the content. All software is browser-based, requiring no download to client computers, and all common browsers are supported.

Store full context of the data in conformance with ISO 17025 reporting requirements. This includes raw test data, derived and representative data, statistical data without limit, test reports, pictures, source, technique, and test information (required for authentication of data).

Manage users and their roles, control who has authorship, ownership, and user management rights. Control the flow of data according to the business practice of your enterprise.

The unique patented architecture allows you to easily augment the different kinds of data and supporting information without database modification. Augment the type of properties and property related information that can be stored, as well as the types of materials on the fly. No limits!

Import your legacy data using built-in data importers and Excel worksheet import software. Materials information, single-point and curve data, and CAE material files can be bulk imported into Matereality libraries.



CAD master material files for CATIA®, Creo®, Teamcenter® software.

CAE master material files for ANSA™, HyperWorks® software.

Send material files to SIMULIA® Abaqus/CAE, ANSYS®, Autodesk®, LS-Dyna®, Moldflow®, Moldex3D, NX Nastran, PAM-CRASH, RADIOSS®, Simpoie-Mold, SOLIDWORKS® software.

One-click export to Excel.

The collaboration layer allows you to send rich data links to collaborators and stakeholders. Users can request data or material models from your test lab or CAE expert to fill holes in the database.

In any enterprise it is essential to control who sees what data. The data management layer provides total control for each piece of data: public, hidden, or accessible only to designated personnel or groups. Access Logs monitor who is using the data.

The authorship layer makes it easy for domain experts within your organization to add material definitions, composition, processing, specifications, property data, and CAE material files to the libraries, all carefully catalogued and linked for posterity.

software modules

These tools ease daily tasks including data comparison and analysis, statistics, CAE material parameter conversion, and report writing, while populating the libraries with meaningful information that benefits the entire enterprise.



Viewer



The Viewer is used to view and analyze material data of any complexity with detailed data inspection and curve interrogation, zoom, variability and trend analytics. Plot equations against raw data. Automatically convert units, create graphs for visualization and export to Excel, reports and presentations.



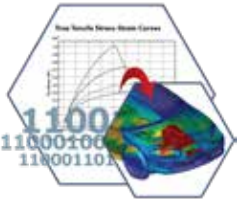
Clipboard



The Clipboard provides a workspace to collect material datasets for comparison and analysis. Reports can be created using the automated Printer module.



Modeler



The Modeler creates CAE material parameters from raw material data and writes CAE-ready input material files. This includes simple elastic, elastic-plastic, temperature/rate-dependent, viscoelastic, hyperelastic material models for FEA, plus injection-molding simulation parameters. A graphical user interface allows for editing and fine-tuning of the material model parameters prior to material file creation.



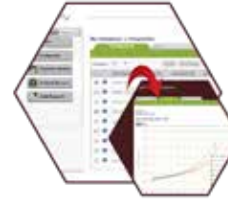
Printer



The Printer module automatically compiles test data, graphs, and analytics of one or more datasets into a document. Select the sections you do not want to print, annotate with your comments and observations. Then print to paper or PDF.



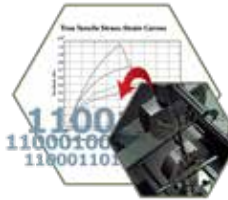
Analyzer



The Analyzer provides analytical tools to compare and contrast materials. It can be used to view historical data trends and perform statistical analysis on single-point data for quality control applications. Automated cross-plotting of curve data allows different materials to be quickly compared without export to Excel.



Loader



The Loader allows users to populate their material libraries with properties. Capture single point or multivariate data, images, graphs, equation coefficients. Fit and plot equations against raw data. Record pedigree and traceability information in conformance with ISO 17025 reporting requirements. Attach test reports.



Importer



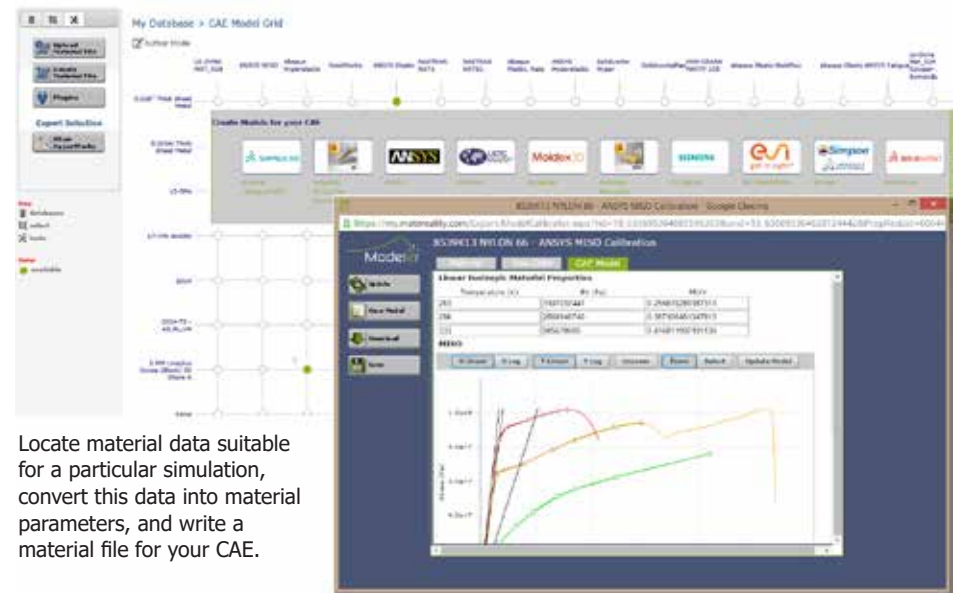
The Importer module allows for cut and paste import of tables of data, material nomenclatures, specifications, and other materials information. Use the Excel Importer to map your standard Excel lab outputs for one-click import to your Properties Library.

user experiences

Matereality provides tailored experiences for engineering teams by providing apps and software modules for effective visualization, comparison, analysis, export, and data sharing, as well as authorship and certification.

general engineering

- Consume materials information, properties, CAE material files
- Assign materials or specifications to parts (BOM)
- View, analyze, and compare material data
- Prepare plots for presentations
- Export data to Excel
- Share data and provide access to colleagues and stakeholders

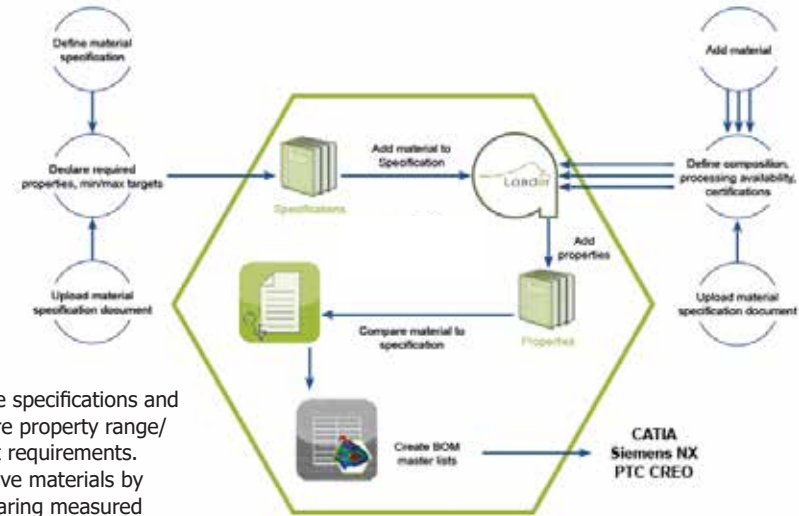


Locate material data suitable for a particular simulation, convert this data into material parameters, and write a material file for your CAE.

author experiences

materials engineering

- Define materials that are used by the enterprise
- Collect materials information and properties in one location
- Maintain regulatory information
- Create and manage materials specifications
- Qualify materials to specifications



Create specifications and declare property range/target requirements. Approve materials by comparing measured properties to specification. Remove non-conforming materials.

author experiences

Matereality provides apps and software modules to bridge the test laboratories with product development teams, for help with creating CAE material cards and master files and selectively sharing data in the right format with relevant collaborators.

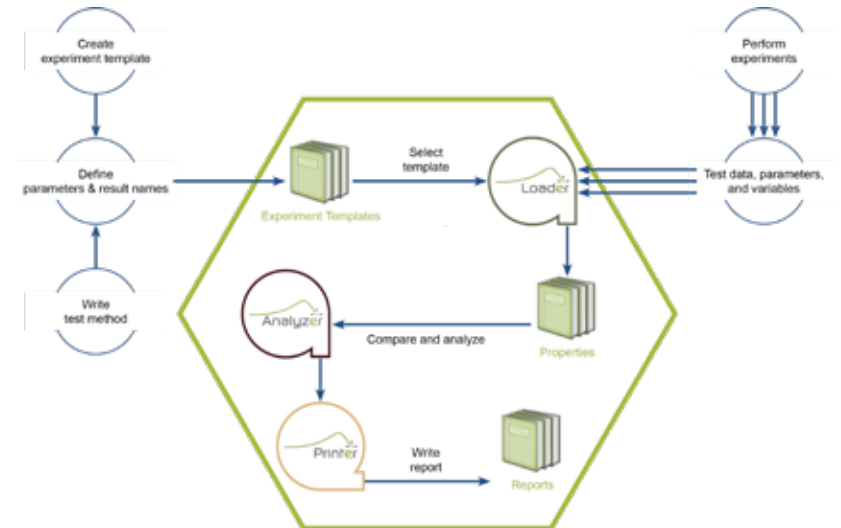
CAE and product development

- Create and save material files for different solvers from raw data
- Archive externally created CAE material files
- Extract properties from CAE material files
- Assemble and deploy master material files to common CAE pre-processors



test laboratories

- Add laboratory test data with full contextual information for traceability
- Create test reports
- Attach test reports to material data
- Transfer results directly to data owner's libraries



operate your lab with eLim

- Create catalogs of available tests
- Allow users to request testing from the test catalog
- Schedule and monitor testing for the lab
- Analyze data and create test reports
- Deliver data and reports to the end user



laboratory information: managed

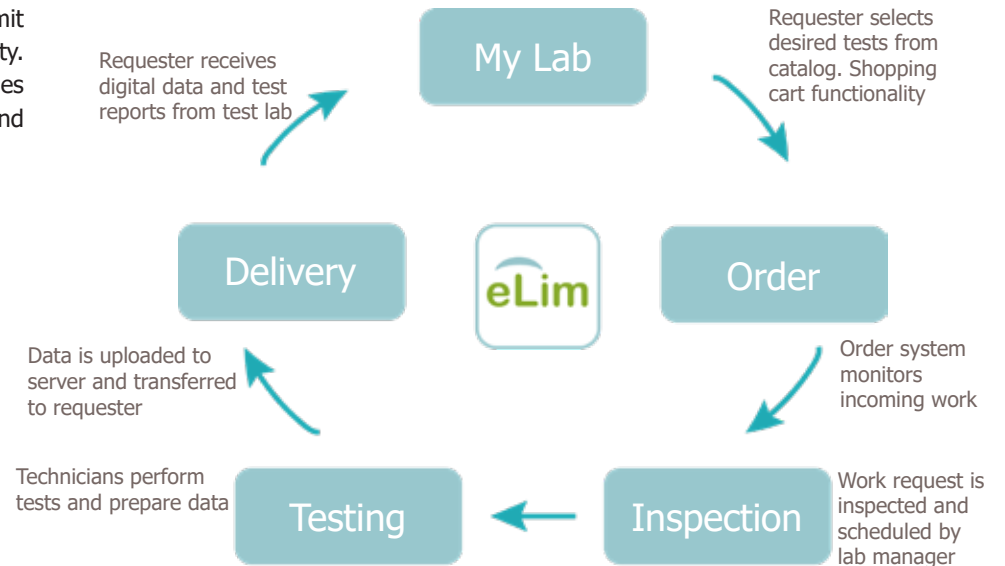
Test laboratories benefit greatly from a digital infrastructure where engineers can submit clearly defined test orders that can be carried out by the lab technicians without ambiguity. Combined with features to schedule and track the progress of lab work, eLim leverages all the capability of the Matereality software, from data analysis, to report creation and delivery – all within a single environment.

capabilities

- Create catalogs of available tests
- Allow users to request testing from the test catalog
- Schedule and monitor testing for the lab
- Analyze data and create test reports
- Deliver data and reports to the end user

configurations for elim:

- Matereality Material Data Server to operate your test labs
- PICSCI Electronic Lab Notebooks to operate R&D facilities



Detailed test catalogs can be created to help engineers select the desired testing. Tests can be assembled in a shopping cart. Testing request details are transferred directly from requester to technician after lab management review.

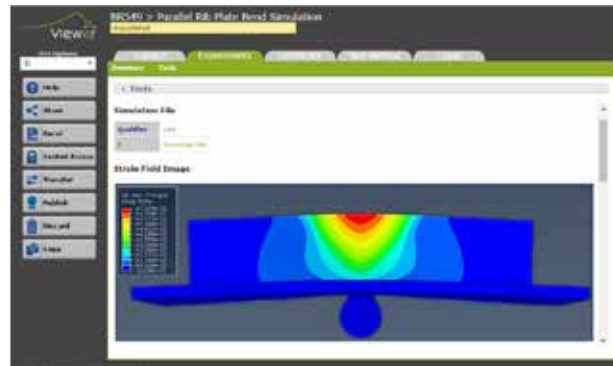
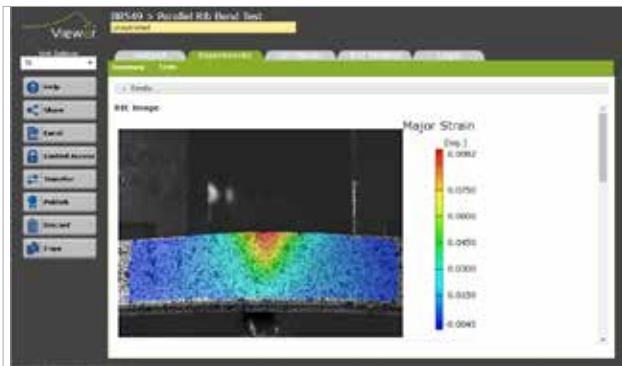
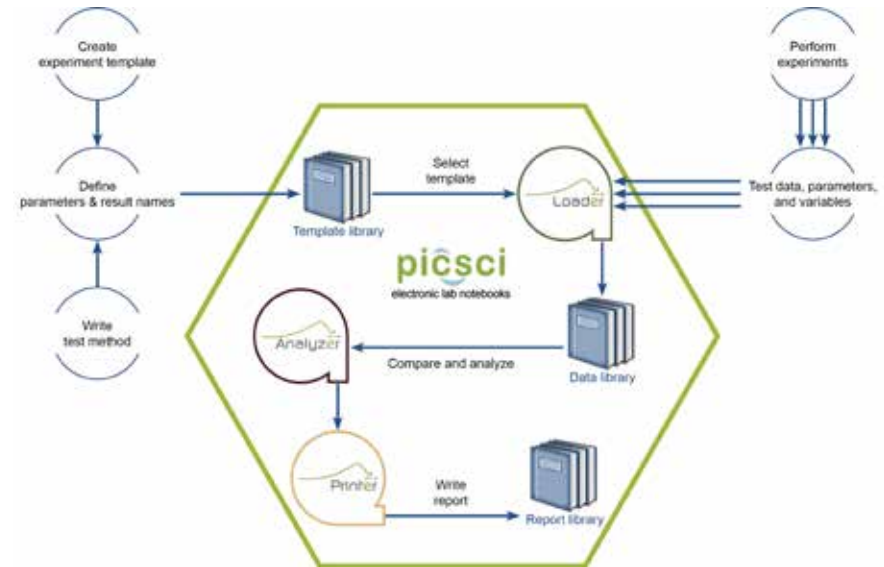
electronic lab notebooks for R&D

While Maturity captures and helps analyze any data for any material, product development and R&D teams also need to capture other experimental data. Because of the enormous diversity of experimentation, the resulting data is highly heterogeneous and is not easily captured in conventional databases. Many companies today capture experimental data in Excel, which can lead to attrition and loss.

PICSCI organizes scientific data in an intuitive and tedious-free form with web-based software that facilitates analysis. Heterogeneous groups can store, manage, and collaborate, all on a single secure system. Maturity-style extensibility ensures that you can record any kind of experiments without database redesign.

capabilities

- Data diversity: store experimental data on an infrastructure designed to capture scientific data in complete detail
- Project management: automated agglomeration of experimental work yields holistic project views
- Analytics: tools to visualize, compare, and work with all forms of data
- Document writing: create test reports with automated multi-variate analytics
- Collaboration: selective sharing with colleagues, project team, enterprise
- Governance: stewardship, privacy, access controls & activity tracking



Capturing and analyzing data from physical experiments and computer simulation on a single infrastructure.

testing facilities

DatapointLabs Technical Center for Materials is a US-based center of excellence for the measurement of physical properties of materials needed for product development, CAE, and R&D. With our testing services and software for materials, we help companies build enduring data collections that accurately represent the materials used in their products and accelerate the pace of product development. Our group now has software and services that facilitate all interactions with materials information across the simulation and product life cycle.

simulation partners

DatapointLabs' materials experts have been serving material inputs for leading CAE solvers for over two decades. Our experts are familiar with your materials in simulation needs, and in cooperation with our software partners, we provide complete solutions to your material modeling questions.

material testing

TestCart

comprehensive online catalog and order system for physical, thermal, and flow properties of materials for use in product development and R&D

metals, plastics, composites, rubber, foam, rubber, films



data for CAE

TestPaks[®]

material testing and material parameter conversion to create material cards for over 30 simulation (CAE) programs, including finite-element analysis, crash and drop-test simulations, injection-molding and other process simulations



validation

CAETestBench

validate your simulation against a physical part, created and tested using a rigid protocol to probe the accuracy of the simulation and quantify its ability to replicate the test

validations range from simple tensile modes to more complex, multi-axial modes, impact, and failure



Knowmats

curates the knowledge of the world related to materials in simulation using contributor posts, links, and preprints from simulation professionals in academia, software companies, consultants and material modeling experts

about Applus+ DatapointLabs & Matereality

DatapointLabs was founded in 1995, by Cornell University alumni, with a mission to provide scientifically accurate material data for use in engineering design and simulation. To date, more than 30,000 materials have flowed through the laboratory, providing data for over 1,200 companies in 11 manufacturing verticals including aerospace, automotive, biomedical, consumer products, electronics, and material suppliers.

Matereality, started in 2002 to meet the challenge of managing vast amounts of highly diverse data, now provides robust, field-tested, patent-protected, cloud and enterprise software to companies seeking to gain control of their materials information, test labs, and R&D facilities.

In 2018, DatapointLabs and Matereality joined the Applus+ Group, a worldwide leader in the testing, inspection and certification sector. DatapointLabs forms part of the Applus+ Laboratories division, which provides a wide range of testing and engineering services to industrial sectors including aerospace, automotive, electronics, information technologies, and oil and gas.

In the field of materials testing, Applus+ has a network of laboratories in Europe, USA, and China, specialized in characterization tests and quality control for metallic and non-metallic materials.



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